

BACHELOR OF SCIENCE IN PHYSICS: CONCENTRATION IN ASTROPHYSICS – PHYS ASSOCIATE DEGREE FOR TRANSFER ROADMAP

This is a sample pathway for students who transfer to San Francisco State University in the current Bulletin year with an AS-T in Physics. Twenty-four units in the major (MATH 226, MATH 227, MATH 228, PHYS 220, PHYS 222, PHYS 230, PHYS 232, PHYS 240, and PHYS 242) and all lower-division GE requirements have been satisfied. Additional units in the major may have been satisfied. Check with a major advisor about the most appropriate course sequence. **Degree completion guaranteed in 60 units**; see the Associate Degree for Transfer (ADT) section for more information (<http://bulletin.sfsu.edu/undergraduate-admissions/transfer-students/>).

Course	Title	Units
First Semester		
ASTR 301	Observational Astronomy Laboratory ¹	2
MATH 245 or MATH 376	Elementary Differential Equations and Linear Algebra ^{2,3} or Ordinary Differential Equations I	3
PHYS 320	Modern Physics I ¹	3
GE Area UD–B: Upper Division Physical and/or Life Sciences ⁴		3
University Elective		3
	Units	14
Second Semester		
ASTR 300	Stars, Planets, and the Milky Way ⁵	3
ASTR 340GW	The Big Bang - GVAR ⁵	3
CSC 309	Computer Programming	3
PHYS 360	Electricity and Magnetism I ^{5,6}	3
PHYS 370	Thermodynamics and Statistical Mechanics ⁵	3
	Units	15
Third Semester		
ASTR 400	Stellar Astrophysics ¹	3
HIST 470 or HIST 471	The U.S. Constitution to 1896 ⁷ or The U.S. Constitution Since 1896	3
PHYS 430	Quantum Mechanics I ¹	3
PHYS 460	Electricity and Magnetism II ¹	3
GE Area UD–B: Upper Division Physical and/or Life Sciences or University Elective if UD-B is Already Satisfied		3
	Units	15
Fourth Semester		
ASTR 470	Observational Techniques in Astronomy ⁵	3
ASTR 498 & PHYS 695 or ASTR 697	Astronomy Research Literature ⁵ or Senior Project	3
RRS 600/HIST 466 or AIS 460	History of People of Color in the U.S. ⁸ or Power and Politics in American Indian History	3
Major Elective		3

University Elective	4
	Units
	16
	Total Units
	60

- 1 ASTR 301, ASTR 400, PHYS 320, PHYS 430 and PHYS 460 offered fall semesters only.
- 2 Take PHYS 330 if MATH 245 complete.
- 3 A course in differential equations and linear algebra is required before taking PHYS 330 and PHYS 385. Students transferring in without an equivalent to MATH 245 must delay taking PHYS 330 and PHYS 385 until the following Fall semester, which will affect other elements of this sample roadmap. Overall time for degree completion will be extended. *Students in this situation should consult with a department advisor for an alternate advising plan.*
- 4 Take PHYS 385 if MATH 245 complete.
- 5 ASTR 300, ASTR 340GW, ASTR 470, ASTR 697, PHYS 360 and PHYS 370 offered spring semesters only.
- 6 PHYS 385 must be taken before PHYS 360.
- 7 HIST 470 and HIST 471 satisfy GE: UD-C, US History and US/CA/local Government.
- 8 AIS 460 and HIST 466 satisfy GE: UD-D and US History.

To Do at SF State:

Enough total units to reach 120 minimum for graduation; 30 units minimum at the upper-division level; to include the following:

University-Wide Requirements: 9-15 Units

- American Institutions (0-6 units) - US History, US Government, California State and Local Government. See next bullet if not completed before transfer.
- Upper division GE (9 units): Courses approved for both UD GE and American Institutions may double-count.
- Students entering the major with the AS-T in Physics are not required to fulfill SF State Studies or Complementary Studies requirements.

Physics B.S. (Astrophysics) Major: 44-47 units

MATH 226, MATH 227, MATH 228, PHYS 220, PHYS 222, PHYS 230, PHYS 232, PHYS 240, and PHYS 242 met in transfer.

- Prerequisites (3 units if MATH 245 equivalent not completed before transfer; see note 3 above)
- Upper-division Requirements (38 units)
- Upper-division Electives (6 units): Units in physics or astronomy selected with the consent of advisor. Three of the six elective units must be in courses numbered 400-499. No more than one unit of a 600-level ASTR course may count towards the electives.

University Electives: Seven or More Units

Depends on course choices made at the community college, how transferred units are applied to the requirements above, and course choices at SF State. Some courses may meet more than one requirement, e.g., both in UD GE and the major.